Digital Cultural Heritage
Program summer term 2024

Seminar

12024 – Nicola Lercari: Critical Heritage
Block seminar: Friday, 28.6.2024 (10-12 c.t.), Monday-Thursday, 22-25.7.2024 (10-16 s.t.), Friday, 26.7.2024 (10-14), Main Building, Geschwister-Scholl-Platz 1, C016
This course conceives heritage as a cultural practice, which is integral to shaping, overseeing, and reconciling the diverse values and meanings assigned to heritage on both local and global scales. Probing knowledge from the field of Critical Heritage Studies, students will investigate the impact of contemporary heritage theories and concepts on the crucial discussions surrounding the characterization of global, national, and local heritage, along with considerations of universal, community, and individual rights. For instance, we will ask: What constitutes heritage? Who holds the authority to define it? Who ought to oversee its management and preservation? In what ways does the concept of heritage serve to unite or potentially create divisions within communities? What repercussions arise from the diverse approaches that different groups take in appropriating and utilizing heritage? Is there a universally recognized human right to unrestricted access, expression, and preservation of heritage? And if such a right exists, how is it manifested? How do globalization, migrations, and climate change affect heritage issues? How is the concept of heritage changing in the Digital Age? These topics will be examined through a cross-geographical and cross-historical examination of case studies, contributing to the elucidation of the concept of heritage both at local and global levels.
Drawing upon a multitude of instances of both local and global heritage, the seminar delves into heritage through a critical perspective. The topics and discussions encompass various aspects, such as heritage as a cultural process; different uses of heritage; considerations of authenticity and value in heritage; heritage and human rights; the role of heritage in nationbuilding and identity; the complex relationship between conflict, war, memories, and heritage; at-risk heritage; difficult heritage; heritage and social justice; intangible heritage and intellectual property; indigenous heritage; the ethics of cultural heritage; the connections between heritage, forced migration, and climate crises. Students will also engage with other relevant topics in international relations, cultural diplomacy, human rights, economics, the environment, and globalization.

Practical courses

12026 – Nicola Lercari: Laser Scanning & Mapping for Cultural Heritage and Archaeology

Block exercise: Thursday, 27.6.2024 (10-14 s.t.), Friday, 28.6.2024 (14-19 s.t.), Sunday, 30.6.2024 (10-18 s.t.), Friday, 5.7.2024 (14-19 s.t.), Thursday, 11.7.2024 (10-14 s.t.), Friday, 12.7.2024 (14-18 s.t.), Saturday, 13.7.2024 (10-18 s.t.), CIP-Pool Akademiestraße 7 (backyard)

Heritage professionals and archaeologists have long utilized laser scanning or Light Detection and Ranging (LiDAR) techniques to digitize artifacts and museum objects or to document and map historic buildings, archaeological sites, and cultural landscapes. In this course, you will develop competencies in laser scanning applications in cultural heritage and archaeology through field and computer lab activities, which will introduce basic principles and toolsets. Exercises encompass multiple workflows, including digitization or site planning, scanning, processing raw data (scans), creating derived products (i.e., digital drawings, 3D mesh models, and digital elevation models), and data visualization for analysis and dissemination purposes. Covered techniques may include object digitization using structured light scanning, architectural documentation using terrestrial laser scanning, and site and landscape mapping using airborne LiDAR, among others. You will complete several exercises and present your work at the Institute for Digital Cultural Heritage XR Lab. Excursion(s) will complement the laboratory activities and expose students to real case studies.

This (block) planned exercise course covers the following key concepts and toolsets in laser scanning and mapping applications for cultural heritage and archaeology: laser scanning technology (e.g., different types of scanners and applications, proprietary versus open-source scanning software, processing workstations); planning (e.g., analyze site/collection conditions; workflow planning; site planning; data management; end products); data capture (e.g., laser safety; operational safety; calibration; range and coverage; resolution and accuracy; intensity and color; control and georeferencing; common mistakes); data processing (e.g., raw vs. pre-processed; cleaning; noise and distance filtering; segmentation; sectioning; classification; meshing; rendering; vectorization for CAD/BIM; exporting and file formats; image-based output); basic considerations on data analysis for research-driven applications (e.g., data fusion, data integration with BIM and CAD, further analysis in GIS; cloud integration); basic visualization principles and tools (e.g., GIS visualization tools; rendering; animation).

12027 – Bruno Sartini: Introduction to Web Design for Humanists

Thursday, 14-17, CIP-Pool 2, Akademiestraße 7 (backyard)

This course offers a foundational exploration and practice of key elements in web design. The topics covered include HTML, CSS, introductory aspects of JavaScript, and the Bootstrap framework for responsive design. Additionally, students will gain proficiency in using data visualization tools for the web. Students will engage in different exercises where they will need to apply and transfer acquired skills, ensuring that they not only become familiar with the theoretical foundation of web

design but also gain the competence to solve problems within this discipline. By the course's conclusion, students will possess the ability to examine, rewrite, and organize web content while successfully applying design principles to construct compelling and responsive websites tailored for humanistic purposes and beyond. This course sets the stage for a holistic understanding of web design principles, providing students with the tools to navigate the ever-evolving landscape of web design and digital communication.

12028 – Dario Calderone: LiDAR, Remote sensing, and GIS applications in Cultural Heritage and Archaeology

Tuesday, 9-12, CIP-Pool Akademiestraße 7 (backyard)

Heritage professionals and archaeologists have long utilized LiDAR applications and remote sensing for the study and topographic analysis of historic buildings, and archaeological contexts. In this course, students will develop competencies in the use of these tools in cultural heritage and archaeology, through computer lab and on-field activities, which will introduce basic topographical principles, on-field working methods, toolsets management and use, and data postprocessing. Exercises will encompass an entire workflow from data collection on the field to image management, georeferencing, and vectorization. GIS applications will be used for the final manipulations and management of LiDAR images. In this way, obtaining derived products, like maps, digital elevation models (DEM), and data visualizations for analysis and dissemination will be possible. At the end of the course, students will be able to use LiDAR and remote sensing tools to process, represent, and archive spatial data of cultural and archaeological heritage.

According to the planned exercises, the course will cover key concepts and the use of the Remote Sensing toolset and LiDAR applications in cultural heritage and archaeology. In particular, the course will be dedicated to the use in the field of the GNSS station, of Last Tools and Quantum GIS software in the lab: introduction to application cases (description of the cases, and reasons, which make the use of Lidar images useful in the field of study and planning of the archaeological and cultural heritage); creation of projects (introduction to the main work tools, management of different tools and dataset); introduction to Reference Systems; data loading; data management (info extrapolation, digital elevation model creations (DEM), Vector editing, digitization and geometric correction tools); Introduction to query tools (to select a subset of features and table records.); basic considerations on LiDAR analysis of the territory for research-driven applications (e.g. application of LiDAR images analyses in topography); analysis and study of the main on-line sites that offer LiDAR satellite images in Europe (free and paid).

12029 – Bruno Sartini: Heritage and the machine: introduction to knowledge representation and extraction

Tuesday, 14-17, CIP-Pool 2, Akademiestraße 7 (backyard)

This course serves as a comprehensive introduction to navigating the complexities of cultural heritage semantic information systems. Students will become familiar with fundamental concepts within the Linked Open Data (LOD) domain such as ontology, triple, knowledge graph, knowledge representation and knowledge extraction.

The course then delves into ontology design practices using the software Protégé and the extraction of LOD with the querying language SPARQL. Through hands-on activities, students develop practical skills in LOD, such as understanding and designing cultural heritage ontologies and querying cultural heritage semantic datasets. By the course's end, participants gain proficiency in ontology design and SPARQL, providing a foundational understanding of the creation and querying processes applied to data models for semantic databases about cultural heritage. No prior knowledge about linked open data is needed to follow this course.